

Method and Apparatus for Accessing a Text Based Information Service

Field of the Invention

- 5 This invention relates to the provision of text based information services, particularly but not exclusively to a method of accessing a teletext service through a television system.

Background

- 10 The provision of text based information services, for example teletext, for viewing on a conventional television receiver, is well-known. The BBC's Ceefax™ service and ITV's Teletext™ service are examples of commercial versions of teletext services. Teletext is a data format which enables data to be transmitted within a video signal. Commonly, teletext data is encoded in unused parts of the video
15 signal, for example in the vertical blanking interval. Teletext data can also be transmitted over a dedicated channel, if this is available, for example in a cable or satellite television system.

- In a conventional television system having a teletext facility, a viewer switches
20 between the television and teletext modes using, for example, a "TEXT" button on a remote control unit. In the teletext mode, a viewer selects a page that he wishes to view by entering the page number on the remote control unit. Page numbers are defined in the teletext standard as a 3-digit number in the range 100 to 899, consisting of one 'magazine' digit plus two page number digits.

- 25 Increasingly, television viewers are demanding, and service or programme providers seeking to provide, additional information relating to television programmes currently being broadcast. For example, television viewers can retrieve scores, detailed results and other facts when watching sports programmes. Cooking
30 programmes often display a page number which sets out the recipes which have been used in the programme. At present, a service provider notifies viewers that there is a teletext page with more information available, by incorporating suitable

text in the standard video signal, for example, "See Teletext Page 580". In response, the viewer presses the TEXT button on his remote control unit to enter teletext mode, and enters the previously displayed three digit page number using the numeric key pad on the remote control unit. This can be inconvenient, since the viewer may forget the page number after switching to the teletext mode, or may enter an incorrect number or even be unable to enter the number easily, for example if he is watching the television programme in low light conditions. Furthermore, the viewer can also have difficulties in reading the number on the screen for the relatively brief time that it appears. Finally, and not to be underestimated, is the general propensity of television viewers to take the option that requires least effort. Faced with the option of entering four keystrokes on their remote control unit, or continuing to watch the programme, many viewers will simply ignore the additional information available to them.

Summary of the Invention

The present invention aims to provide viewers with easier access to such additional information.

According to the present invention, there is provided apparatus for accessing a text based information service from a television programme service, comprising means for providing link information for display during the television programme service, the link information being associated with a selected page of the text based information service, means for receiving a page independent acceptance signal from a display controller, and means for providing the selected page for display in response to the acceptance signal.

By using an acceptance signal which is independent of the page to which the link information corresponds, and therefore breaking the one-to-one correspondence between the keystrokes entered on the display controller and the digits of a page identifier which identifies a page, the process of selecting a page of the text based information service can be made considerably simpler and more reliable. In the case of a teletext service using three digit page identifiers, the process of selecting a page can be reduced by three keystrokes, from the four keystrokes required in a

conventional system to change to teletext mode from TV viewing mode and then to enter a three digit number, to the single keystroke required in accordance with the invention to accept a direct transfer to the page identified on the television screen.

5 Preferably, the link information is provided in a subtitle line.

The apparatus can include means for highlighting the link information, so that the availability of the information in a readily accessible way is drawn to the viewer's attention.

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The apparatus can further comprise means for distinguishing link information from information which does not comprise a link to the text based information service. Preferably, this comprises means for detecting a tag associated with the link information. On detection, the link information can be displayed irrespective of the preferences set by the viewer, so that a viewer does not have to manually set the text viewing mode to obtain the benefit of the invention.

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According to the invention, there is further provided a method of accessing a text based information service from a television programme service via a television receiver, comprising the steps of providing link information associated with a selected page of the text based information service for display during the television programme service, receiving a page independent acceptance signal from a display controller and providing the selected page for display in response to the acceptance signal.

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According to the invention, there is also provided a program to be executed by a processor to enable access to a text based information service from a television programme service, in which link information associated with a selected page of the text based information service is displayed concurrently with a television programme image, wherein the program, when executed by the processor, implements the steps of receiving a page independent acceptance signal from a display controller and providing the selected page for display in response to the acceptance signal.

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There is also provided, in accordance with the invention, apparatus for providing a text based information service to a television receiver, comprising means for providing link information for display during a television programme service, the link information being associated with a page identifier which identifies a selected page of the text based information service, and means for tagging the link information to indicate to the receiver that information received by it includes link information.

10 **Brief Description of the Drawings**

Embodiments of the invention will now be described by way of example with reference to the accompanying drawings, in which:

Figure 1 is a schematic diagram of a digital television system;

Figure 2 is a schematic diagram of the digital television receiver which forms part of the digital television system shown in Figure 1;

Figure 3 is a schematic diagram of the software running in the digital television receiver shown in Figure 2;

Figure 4 is a schematic flow chart illustrating the operation of the invention; and

Figure 5 is a schematic flow chart illustrating the operation of the invention with tagged page numbers.

Detailed Description

Referring to Figure 1, a digital television system with a teletext capability, for example teletext which conforms to the ITU-R System B Teletext format, also

known as EBU Teletext, comprises a digital broadcast station 1 operating according to the Digital Video Broadcasting (DVB) standard and a DVB-compliant digital television receiver 2.

The broadcast station 1 provides a combined television/teletext signal, conveyed for example as MPEG-2 transport stream packets in accordance with current DVB standards, from a broadcast system 3, which is for example a terrestrial transmitter, a cable TV head-end or a satellite broadcast system. The combined signal is

produced by multiplexing fixed format teletext content 4 with broadcast picture data 5 at a multiplexer 6.

5 The digital television receiver 2 includes a receiver 7 and a set top box (STB) 8 coupled to a television set 9. The receiver 7 can be, for example, an aerial, cable receiver or satellite dish, together with the associated electronics for receiving a television signal. The functionality provided by the set top box 8 and/or the receiver electronics can alternatively be integrated into the television set 9. The digital television receiver 2 is controlled by a remote control unit 10, also referred to
10 herein as a display controller. The digital television receiver 2 can alternatively be any apparatus capable of receiving a television/teletext signal, for example a personal computer having a TV display card and teletext decoder.

Referring to Figure 2, the set top box 8 comprises a video stream processor 11 for
15 processing the MPEG-II transport stream from the receiver 7, an audio stream processor 12, a teletext stream processor 13 for processing the teletext packets and a display 14, for example a conventional CRT display forming part of the television 9, for displaying television images and teletext data. Cache memory 15 is provided to enable local storage of teletext pages for subsequent rapid retrieval.

20 Referring to Figure 3, the video stream processor 11 and teletext stream processor 13 modules are implemented in software by television viewing software 16, for example as found in a conventional DVB-compliant digital television receiver and teletext decoding and display software, referred to herein as On Screen Display
25 (OSD) software 17, which is also found in conventional DVB-compliant digital television receivers having a teletext decoding capability.

The OSD software 17 is responsible for decoding streams of teletext packets and controlling the display of the resulting teletext pages on the display 14. For
30 example, a user selects page number 555 on the remote control unit 10 by pressing a 'TEXT' button to enter teletext mode and then typing in the character '5' three times. This selection is received at the STB 8. In response, the OSD software 17 extracts text and graphic information corresponding to page 555 from the video

stream and displays it on the display 14. If a teletext subtitle page is selected, for example page 888 in the United Kingdom, the OSD software 17 extracts the subtitle stream from the video signal and overlays it onto the video picture.

5 In accordance with the invention, an additional software module is provided, referred to herein as the instant access module 18, to run alongside the viewing software 16 and the OSD software 17 and to implement the functionality described below with reference to Figures 4 and 5.

10 Referring to Figure 4, when a service provider wishes to notify television viewers that there is additional information relating to the current television programme available on a certain teletext page, for example page number 345, the service provider transmits a teletext subtitle line to this effect, for example "Top scores on Teletext page 345" (step s1). The teletext subtitle line is transmitted on a teletext
15 subtitle page which is associated with a language code, for example, ENG for English, in the teletext descriptor in the digital video broadcasting service information system known as DVB-SI. A subtitle page in this form is automatically displayed by a conventional DVB-compliant digital television receiver with OSD software, as long as the viewer has enabled teletext subtitling and selected the
20 correct subtitling language (step s2).

To ensure that a viewer's attention is drawn to the additional available information, the instant access module 18 highlights the page number in the subtitle line, for example by causing the page number to flash or by displaying it in a different colour
25 (step s3). In response to the display of the subtitle line containing the highlighted number, the viewer presses a selected key on the remote control unit (RCU) 10, for example an 'OK' key or the 'TEXT' key (step s4). On receiving this key, the instant access software 18 switches the viewing mode to teletext mode and selects the highlighted page number (step s5). The OSD software 17 then displays the selected
30 page (step s6).

Referring to Figure 5, the instant access software 18 can be configured to differentiate subtitle lines containing page number references from ordinary subtitle

lines which incidentally contain three digit numbers, by agreeing a coding scheme with the service provider. For example, the page number is tagged by the service provider prefixing it with a tag combination which would not normally be used (step s10). For example, a combination of [Flash] and [Steady] tags is used, where the [Flash] tag causes the text after it to flash and the [Steady] tag switches off the flash, in the format: [Flash][Steady]Page Number. The subtitle line with tagged page number is transmitted to the receiver 7 (step s11). The instant access software 18 scans through all incoming subtitle lines (step s12) looking for the [Flash][Steady] tag combination. If found, then assuming that teletext subtitling is enabled (step s13), the page number following the tag combination is highlighted and displayed as available for the viewer to accept (step s14). As described in relation to Figure 4, the viewer can accept the offer to view the page corresponding to the displayed page number by pressing a single key on his remote control unit, which triggers display of the corresponding page (steps s15 to s17).

The tag procedure permits enhanced functionality by allowing subtitle lines to be displayed even if the viewer has not enabled teletext subtitling or has selected a non-transmitted language. For example, on detecting a tag, the instant access software 18 overrides the viewer's preferences, as indicated in Figure 5 by the broken lines, sets subtitling mode (step s20) and language and displays a subtitle line with tagged page number (step s14).

The functionality described above with reference to Figures 4 and 5 can be implemented in hardware, software or a combination of hardware and software. A software implementation means that no changes need to be made to the STB hardware or to the tools used by service providers to create teletext pages and insert them into teletext data streams. In this case, the instant access software can be part of the system software in the STB 8 or it can be provided as downloadable application software.

Although the above description is based on the viewer activating the software using only a single entry on his remote control unit, it is envisaged that more than one keystroke is possible. One situation in which two keystrokes may be appropriate is

5 It will be apparent to the person skilled in the art that any form of notification can be used to inform a viewer that there is additional information relating to a current television programme available on teletext. For example, there may simply be a text message stating that additional information is available, without a specific page number being given. Alternatively, an icon may appear, which the viewer has
10 previously been informed represents the availability of further information.

While the invention has been specifically described in relation to teletext, it is applicable to any type of text based information service used in conjunction with a television system.